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International application number: PCT/AU05/000315

International filing date: 08 March 2005 (08.03.2005)

Document type: Certified copy of priority document

Document details: Country/Office: AU
Number: 2004901168
Filing date: 08 March 2004 (08.03.2004)

Date of receipt at the International Bureau: 12 April 2005 (12.04.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)

PCT/AU2005/000315

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I, JANENE PEISKER, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004901168 for a patent by CHRISTOPHER ROBERT MURRAY MITCHELL as filed on 08 March 2004.

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JANENE PEISKER
TEAM LEADER EXAMINATION
SUPPORT AND SALES

CHRISTOPHER ROBERT MURRAY MITCHELL

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PROVISIONAL SPECIFICATION FOR THE INVENTION ENTITLED :

ROCKING APPARATUS FOR AN INFANT ENCLOSURE

This invention is described in the following statement :-

ROCKING APPARATUS FOR AN INFANT ENCLOSURE

Technical Field

This invention relates to rocking apparatus for moving or rocking an infant enclosure such as a cot pram or stroller and in particular to apparatus for use with or associated with baby or infant cots, prams or strollers to effect movement thereof for the purpose of encouraging sleep of infants or babies.

Background Art

It is common where it is desired to induce sleep by a baby or infant to subject the baby or infant to a rocking or other similar motion. It is also known that the motion of a vehicle is particularly effecting in encouraging a baby or infant to sleep. Where a baby or infant is located in a pram or stroller, a mother or person having the care of the infant or baby often will move the pram back and forward by hand in an attempt to induce the baby or infant to sleep. This obviously is a tedious and not always effective task as a simple backwards and forwards motion is often not sufficient to achieve the desired results.

A number of different forms of mechanical or electro-mechanical apparatus have been proposed to effect movement of a pram, stroller or cot. Some of the known devices simply reproduce the manual motion applied to a pram or stroller referred to above by having an arm which is coupled to the stroller or pram and which is reciprocated back and forth. These devices suffer the above referred to disadvantages in that the motion which they impart to a stroller or pram is a simple reciprocating back and forward motion. Other devices which have been proposed are vibratory devices which are coupled to prams, strollers or cots to effect a vibratory movement thereof. Other devices have a platform upon which the whole pram, stroller or cot is supported with the platform being moved to effect movement by a motor device to effect movement of the pram, stroller or cot. Both the latter forms of device have not proved particularly effective due to the nature of the motion imparted to the cot, pram or stroller. These devices furthermore are usually large, difficult to use and or/relatively expensive.

Summary of the Invention

The present invention aims to provide apparatus for moving or rocking an infant enclosure which is of a simple construction and which is particularly effective in

inducing sleep in an infant or baby with the enclose. Other objects and advantages of the invention will become apparent from the following description.

The present invention thus provides in one preferred form apparatus for moving or rocking an infant enclosure of the type having legs by which said enclosure is normally supported on an underlying surface, said apparatus comprising a plurality of support means adapted to be associated with said legs, and motion imparting means associated with at least one of said support means for imparting a motion to said enclosure.

The support means may be interposed between the legs and the underlying surface or may be incorporated in the legs.

The term "infant enclosure" as used throughout the specification includes prams, strollers or other mobile baby or infant carrier which usually have a three-point support defined by respective legs. Most commonly prams, strollers or other mobile carriers have at least three legs terminating in three wheels defining a three-point support. The term "infant enclosure" also includes stationary enclosures such as cots or beds having at least two legs. Typically cots or beds have four legs providing a four point support however cots or beds may only have two legs which for example provide a continuous support along opposite sides of the enclosure. The term "infant enclosure" further includes stands for cots, beds, bassinets or the like which usually have at least a three point support, four example three or more legs.

The term "legs" as used throughout the specification includes any form of support by which the enclosure can be supported on an underlying support surface and includes legs provided with wheels, rollers or casters.

The motion imparted to the enclosure is suitably an oscillating or reciprocating motion. Preferably, the oscillating or reciprocating motion comprises a vertical or substantially vertical motion. The oscillating or reciprocating motion may comprise a constant motion or variable motion.

In a preferred form, only one of the support means includes or is associated with the motion imparting means and the other support means include means for facilitating the continuation of motion in the enclosure. The means for facilitating the continuation of motion in the enclosure may comprise springs or similar resilient or elastic means associated with one or more of the other support means. Thus the resilient support means

may be defined by or include springs, pads of resiliently deformable material such as pads or rubber or plastics or other similar support.

The motion imparting means for inducing movement in the enclosure may comprise an actuator. The actuator may comprise a vibratory actuator which when actuated induces a vibration in the at least one of the support means. Preferably however the actuator includes member which when actuated will impart a vertical or substantially vertical reciprocating or oscillating motion to the enclosure at the one support means. Means are suitably provided to control the actuator to enable actuation thereof as required. Most preferably the one support means is self-contained. Thus where the actuator is an electrical actuator, a power supply for the actuator may be incorporated in the support means. The power supply may typically comprise batteries.

In another form, motion imparting means may be associated with each support means to impart an oscillating or reciprocating motion to each leg. The oscillating or reciprocating motion at at least one of the support means may be different from the oscillating or reciprocating motion at the other support means. Most preferably, the oscillating or reciprocating motion at one support means is different from the motion at each of the other support means. The differences in motion may comprise a difference in frequency of motion or difference in extent or amplitude of motion. The motion at each support means may be in phase with the motion of one or more of the other support means or out of phase with the motion of one or more of the other support means.

The motion imparting means associated with a support means suitably includes an actuator and means are provided for oscillating or reciprocating the actuator. The actuator may include a support arm which may be selectively reciprocated or oscillated. The support arm suitably is oriented in use substantially vertically such as to induce in the enclosure a vertical reciprocation or oscillation of the leg of the enclosure at which the support means is located. The support arm may be the armature or an extension of the armature of a solenoid actuator. Other forms of actuator however may be provided for oscillating or reciprocating the arm.

In one particularly preferred form, each of the support means may include an actuator such that a reciprocating or oscillating motion can be induced in the enclosure at each point support or leg of the enclosure. Preferably the actuator of each support means is actuated independently of the actuation of the actuators of the other support means. Preferably also the reciprocating or oscillating motion of the actuators of each support means is different from the reciprocating or oscillating motion of the actuators of each of the other support

means. Each support means may comprise a self-contained unit. Alternatively each support means may be linked to a controller of a common control unit. The control unit may selectively vary the amplitude or motion or speed of operation of the actuators of each support means.

Two or more actuators may be actuated to impart a particular motion in the enclosure. For example, the actuators on one side of the enclosure may be actuated simultaneously and actuators on the other side of the enclosure also actuated simultaneously but out of phase with the actuators on the one side of the enclosure to impart a side to side rocking motion in the enclosure. Alternatively, actuators at opposite ends of the enclosure may be actuated in a similar manner to impart an end-to-end rocking motion in the enclosure.

The support means may in one embodiment include a socket or saddle to receive a leg of an enclosure which may seat at its lower end in a socket or saddle. Where the legs terminate in wheels or rollers, each wheel or roller may be seated within a socket or saddle.

Means may be provided to positively secure the legs, wheels or rollers to the sockets or saddles. Such means may comprise any suitably fastening means such as clips or ties.

Brief Description of the Drawings

In order that the invention may be more readily understood and put into practical effect, reference will now be made to the accompanying drawings which illustrate a preferred embodiment of the invention and wherein :-

Fig. 1 illustrates one form of rocking apparatus according to an embodiment of the invention associated with a cot (shown partly cut away);

Fig. 2 is an enlarged sectional schematic view of one of the support means of the rocking apparatus of Fig. 1;

Fig. 3 is an enlarged sectional schematic view of an alternative support means of the rocking apparatus; and

Fig. 4 illustrates a further form of rocking apparatus according to an embodiment of the invention associated with a cot (shown partly cut away);

Detailed Description of the Preferred Embodiment

Referring to the drawings and firstly to Figs. 1, there is illustrated rocking apparatus 10 for use with a baby's cot, pram or stroller in the illustrated embodiment a cot 11 which as is conventional has four legs 12 at each corner normally providing a four point support for the cot 11 on an underlying surface 13 such as a floor surface. The rocking apparatus 10 comprises four leg support modules, comprising in this embodiment support modules 14 and 15 of two different configurations. In the illustrated embodiment, the rocking apparatus 10 includes three support modules 14 and one support module 15. The modules 14 and 15 are positioned beneath respective legs 12 such that the cot 11 is supported to the floor surface 13 through a support module14 or 15.

The support modules 14 as shown in Fig. 2 includes a socket 16 in which the lower end of a leg 12 (shown in dotted outline) may locate. The sockets 16 are configured to accept a large range of legs 12 or feet of legs 12 of different configurations. The sockets 16 typically are of a shallow hollow concave configuration from above. Such a configuration also permits the wheels 17 of a pram or stroller to be located securely on respective support modules 14 or 15 (as also shown in dotted outline in Fig. 2).

The support modules 14 of Fig. 2 includes a hollow housing 18 having a base 19 which may seat stability on the underlying support surface 13. The socket 16 is mounted to a substantially vertical shaft 20 or formed integrally with the shaft 20 which extends into the housing 18. Upper and lower guides 21 and 22 guide the shaft 20 in vertical reciprocating or oscillating movement. The shaft 21 also includes a radially extending flange 23 and a compression spring 24 is positioned between the flange 23 and base 19 of the housing 18 such as to provide a spring mounting for legs 12 of the cots 11 supported on the modules 14.

The modules 15 have a similar external configuration to the modules 14 having an external housing 18 and base 19 which can seat on the surface 13. In this case however, the modules 15 include within the housing a solenoid actuator 25 having a solenoid coil 26 and an armature 27 and a socket 16 is mounted to the armature 27 for movement therewith. The actuator 25 is oriented such that the armature 27 thereof is substantially vertical when the base 19 is seated upon the surface 13. Actuation of the solenoid actuator 25 by energising the coil 26 thereof will apply magnetic force to the armature 27 to cause it to move substantially vertically upwardly. A return spring 28 may be provided to restrain

movement of the armature 27 and return the armature 27 from its extended position (shown in dotted outline) after the coil 26 is de-energised.

Power for the solenoid is provided by a power pack 29 within the housing 18 such as a battery power pack. A control unit 30 is also provided within the housing 18 to control supply the current to the solenoid coil 26. The housing 18 also includes a control knob or switch 31 for initiating operation of the support module 15.

In the embodiment of Fig. 1, the cot 11 has three legs 12 supported on respective support modules 14 and the forth leg supported on a support module 15. Thus when current is supplied to the coil 26 under control of the knob or switch 31 and control unit 30, the armature 27 will lift the socket 16 and apply a momentary vertical force to one leg 12 of the cot 11 as shown in dotted outline in Fig. 3. Due to the spring mounting of the other three legs 12 on the support modules 14 provide by the springs 24, the momentary vertical force applied to the one leg 12 will induce an oscillating or rocking motion in the cot 11 and the springs 24 will facilitate the continuation of the reciprocating or oscillating motion of the cot 11. The solenoid actuator 25 may be actuated at regular intervals to maintain the oscillating or rocking motion in the cot 11 under the control of the control unit 30. This motion created in the cot 11 will encourage a baby or infant within the cot 11 to sleep.

The rate of operation of the solenoid actuator 25 may be selectively by the control knob or switch 31 on the housing 18 of the module 15 so that optimum reciprocating or oscillating motion of the cot 11 can be achieved.

Whilst the support module 15 in the illustrated embodiment has a self-contained power supply, it may also be connected to an external power supply such as a mains supply. The control unit 30 for the solenoid actuator 25 may also be provided externally of the housing 18.

Referring now to Fig. 4 there is illustrated an alternative embodiment of rocking apparatus 31 according to the invention again shown in association with a cot 11. In this case however, the legs 12 of the cot 11 are each supported on respective support modules 15 which are all of the type shown in Fig. 3. Further the solenoid actuators 25 of each module 15 are connected by suitable connecting cables 32 to a common controller 33. The controller 33 may include a power supply for connection to the solenoid coils 26 to cause actuation of one or more of the support modules 15. The power supply for example may comprise batteries. Alternatively, the controller 33 may be connectable to an external power supply such as a mains supply.

The controller 33 includes a programmable microprocessor which controls the application of current from the power supply to each of the coils 26 of the solenoid actuators 25 of each support module 15. Each actuator 25 accordingly can be actuated independently of the other actuators 25. Furthermore the microprocessor can control the stroke of the armature 27 of each actuator 25 such that each armature 27 can have a different stroke when actuated. The microprocessor of the controller 33 can also control the phase of operation of each actuator 25.

In use and when the cot 11 is supported on the support modules 15 as in Fig. 4 and a baby or infant placed within the cot 11, the controller 33 can be switched on to cause current to be supplied to each solenoid coil 25. The current is supplied momentary to extend the armatures 27 vertically upwardly and then permit through the springs 28 or gravity the armatures 76 to move downwardly to impart a vertical reciprocating motion in the cot 11 through the leg 12 at each corner of the cot 11. The motion imparted at each corner may be different from the motion imparted at the other corners either by having the armatures 27 operating at a different stroke and/or out of phase with each other.

The motion thus imparted in the cot 11 will be an irregular rocking motion similar to the motion for example of a motor vehicle. It has been found that such a motion is particularly effective in inducing sleep in babies or infants within the cot 11.

The controller 33 may also include a timer which will switch off the power supply to the solenoid actuators 25 after a predetermined time which may be varied by a suitable control knob 34 on the controller 33. Furthermore the controller 33 may also incorporate a player 35 of compact discs or a tape player or alternatively a solid-state memory device which stores music recording or other sounds. Such a device or player may be actuated when the controller 33 is actuated so that relaxing music is played at the same time as actuation of the support modules 15.

The controller 33 may be programmed to provide specific motions to the cot 11. For example, the two modules 15 on one side of the cot 11 may be actuated simultaneously and regularly and the two modules 15 on the opposite side of the cot 11 also actuated simultaneously and regularly but out of phase of actuation of the modules 15 on the one side of the cot 11. This will induce a side-to-side rocking motion in the cot 11. In a similar manner, the support modules 15 may be actuated to induce an end-to-end rocking motion in the cot 11.

Whilst the apparatus described above is particularly suited for use with infant or baby cots, it may also be used as referred to with prams or strollers with the selected support modules or combination of modules 14 and/or 15 located under each wheel. Usually in this case it is preferred that the apparatus be portable and therefore each support module 15 include its own power supply suitably batteries to allow the apparatus to be used in locations where mains power is not available.

Further whilst the actuators of the apparatus are described as solenoid actuators, they may comprise other forms of electrical actuator. In some embodiments also it is possible to use employ mechanical actuators such as spring driven actuators.

In the embodiments of rocking apparatus described above, the support modules 14 and 15 are shown as being separate from the cot 11 (or other enclosure to be supported). In some embodiments, the support modules 14 and/or 15 may be incorporated into the legs of the enclosure.

Thus whilst the above has been given by way of illustrative embodiment of the invention, all such variations and modifications thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of the invention as herein set forth.

Dated this eighth day of March 2004

CHRISTOPHER ROBERT MURRAY MITCHELL
By His Patent Attorney

JOHN R G GARDNER

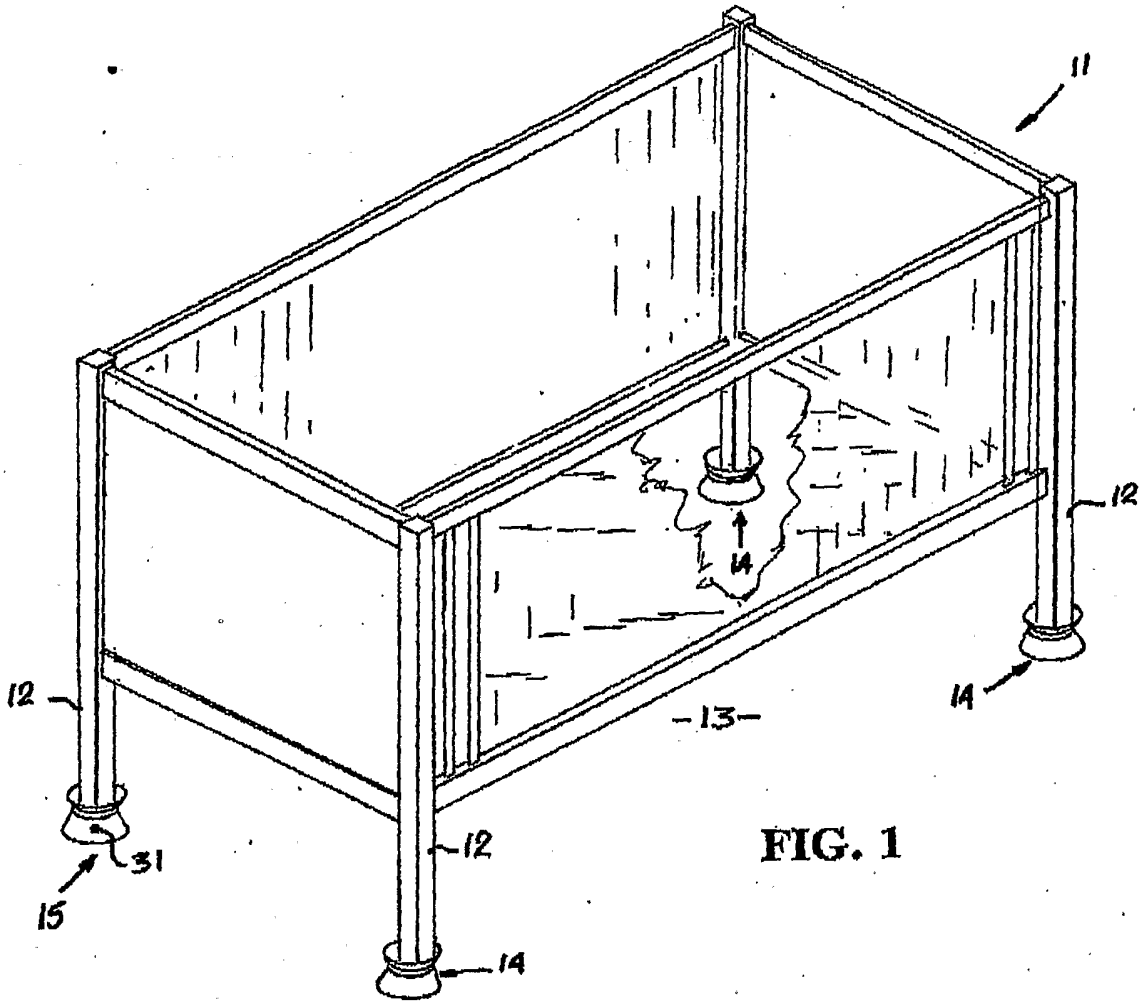

FIG. 1

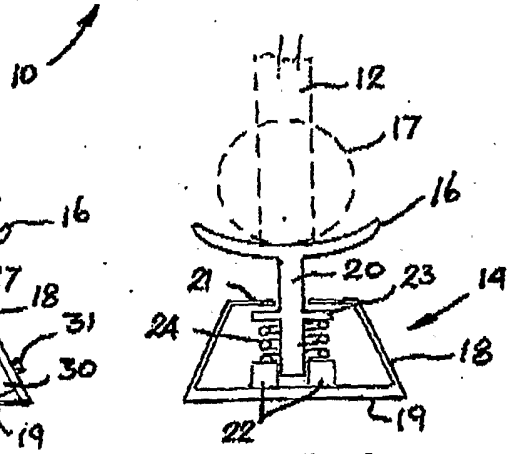

FIG. 2

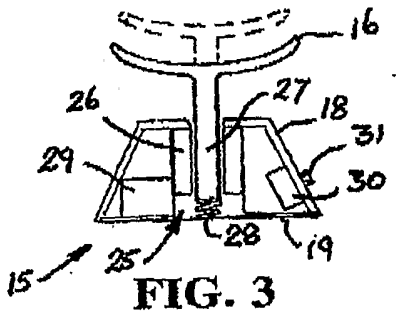

FIG. 3

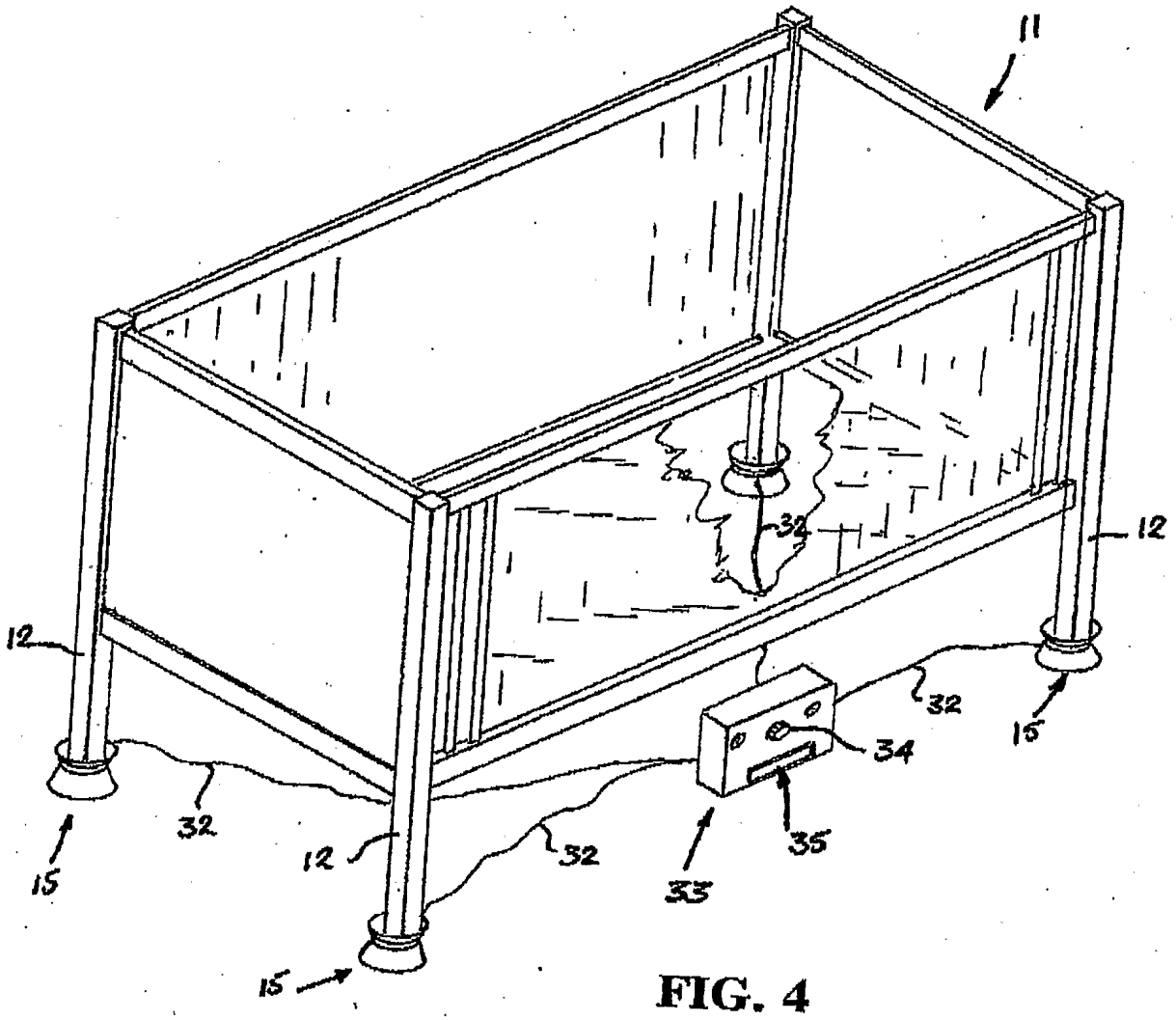

FIG. 4